

XIV. OBSERVATIONS ON TADPOLES OF A MEGALOPHRYS

By LAWRENCE E. GRIFFIN

In May 1913 a number of tadpoles about an inch in length were discovered in a spring on the hillside east of the town of Taytay, Palawan, Philippine Islands. A brief observation of them in their native habitat showed that they presented some most interesting features, so they were examined more carefully in our laboratory.

Around the mouth of the tadpole is a large diamond-shaped expansion of the integument, broader than the greatest diameter of the body. Otherwise the body presented no features markedly different from ordinary tadpoles. The bodies were of a rich velvety-brown color, with faint lighter mottlings. The ground-color of the iris was golden-yellow, almost obscured by fine brown dots. In the spring and the aquarium the animals would remain almost motionless for long periods of time. They seemed to prefer to rest in very shallow water under the shady side of a pebble, with the head protruding and the oral membrane at the surface of the water. Under these conditions the membrane is fully expanded and flat, except at the center where a funnel-shaped depression leads into the mouth. In deeper water they float just under the surface in a vertical position, appearing as if the body were suspended from the expanded oral membrane. When the tadpoles sink to the bottom they lie partly on one side, and the oral membrane is contracted with its tips pointed forward like tiny horns.

When disturbed the tadpoles are unusually swift and strong in their movements, being as difficult to catch as small gobies.

The oral membrane and lips form an unusual feeding mechanism. On the external portion of the membrane are several rows of cutaneous denticles; arranged so as to leave a median trough free from these structures which extends completely across the membrane and surrounds the mouth. The lips project at the center of the trough, the upper lip considerably, the lower one very little. The upper lip is thin with a lobulated edge. Around the ventral and lateral margins of the mouth appears to be a band of cartilage.

When the tadpoles feed the oral membrane is expanded at the

surface of the water, and the lips open and close so rapidly that it is scarcely possible to count the movements. In this way, possibly aided by swallowing movements, a strong current of water is forced into the mouth, through the pharynx, and out the spiracle. The expanded membrane appears to be on the surface of the water, but in reality is slightly below the surface. For the water passing into the mouth produces a surface-current which flows against all sides of the membrane, not at the ends only, as is shown by particles in the water being drawn against all parts of the edge of the membrane. The current is strong enough to move insects six to eight millimeters in length, and may be noticed two centimeters away from the oral membrane. Fine particles enter the extremities of the shallow grooves at the lateral tips of the membrane and pass along these to the mouth. Larger objects strike against the edge of the membrane or against the denticles, where they remain until flipped away by a quick motion of the membrane.

No adult frogs were discovered which would assist in the identification of the species to which these tadpoles belonged. However, they are so much like the tadpoles found by Annandale at Bukit

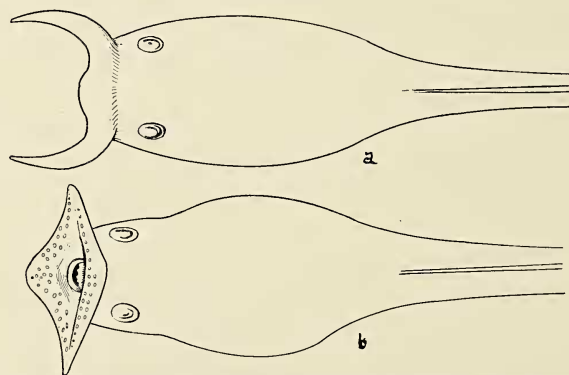


FIG. 1. *a*. Outline sketch of the appearance of the head of the tadpole with the oral membrane in the position assumed when the tadpole rests at the bottom; *b*. Oral membrane expanded in the position assumed when feeding.

Besar, Malay Peninsula*, that it is probable the Philippine forms are of some species of *Megalophrys*. Comparison with the figures of Annandale will show that they cannot be of the same species as he

*Cambridge Natural History, Vol. VIII, p. 59, fig. 11.

found. Annandale thought that the oral membrane served as a float to keep the animals in their characteristic position at the surface of the pool, and that possibly the whole apparatus is used for scraping the under surface of water leaves for food. Our observations make it quite clear that the oral membrane is a remarkably effective adaptation for securing food from the surface film of the pool in which the tadpoles live.